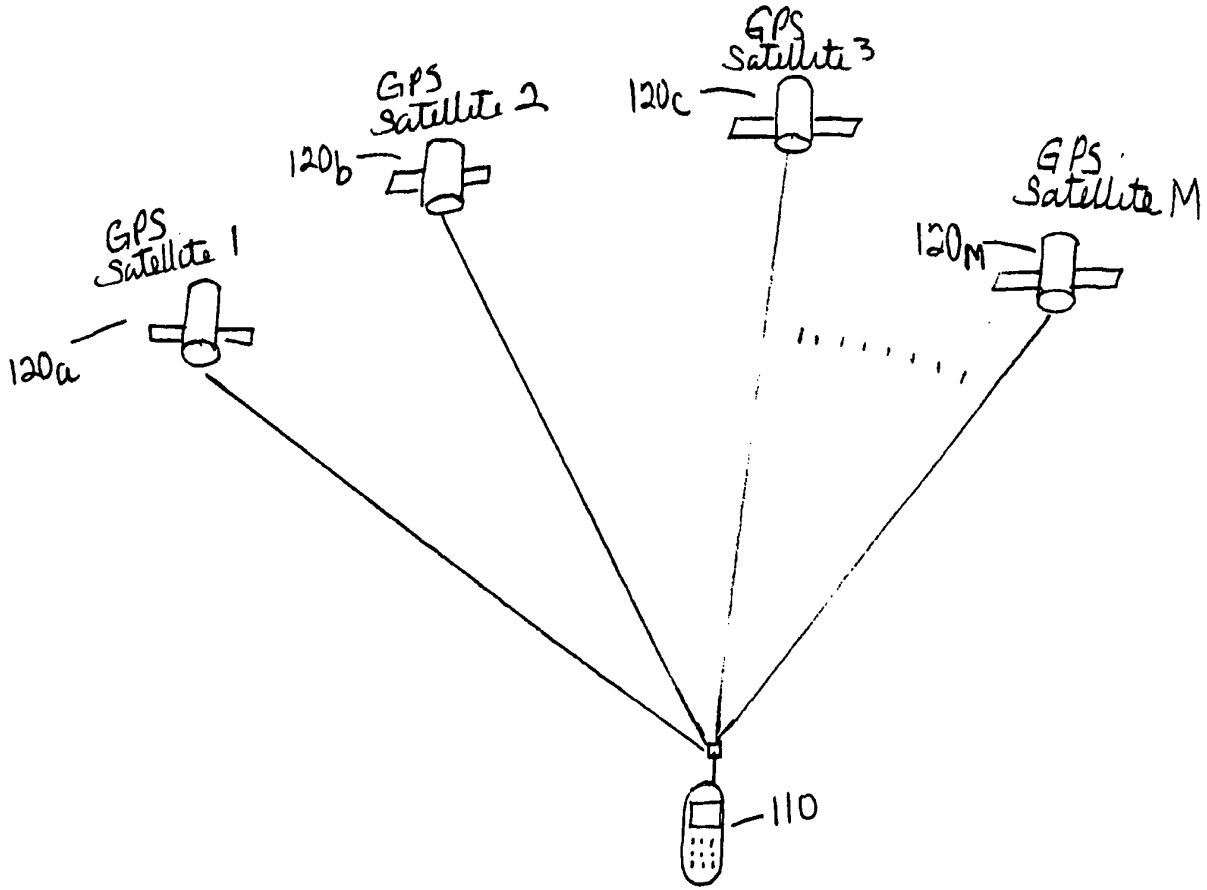
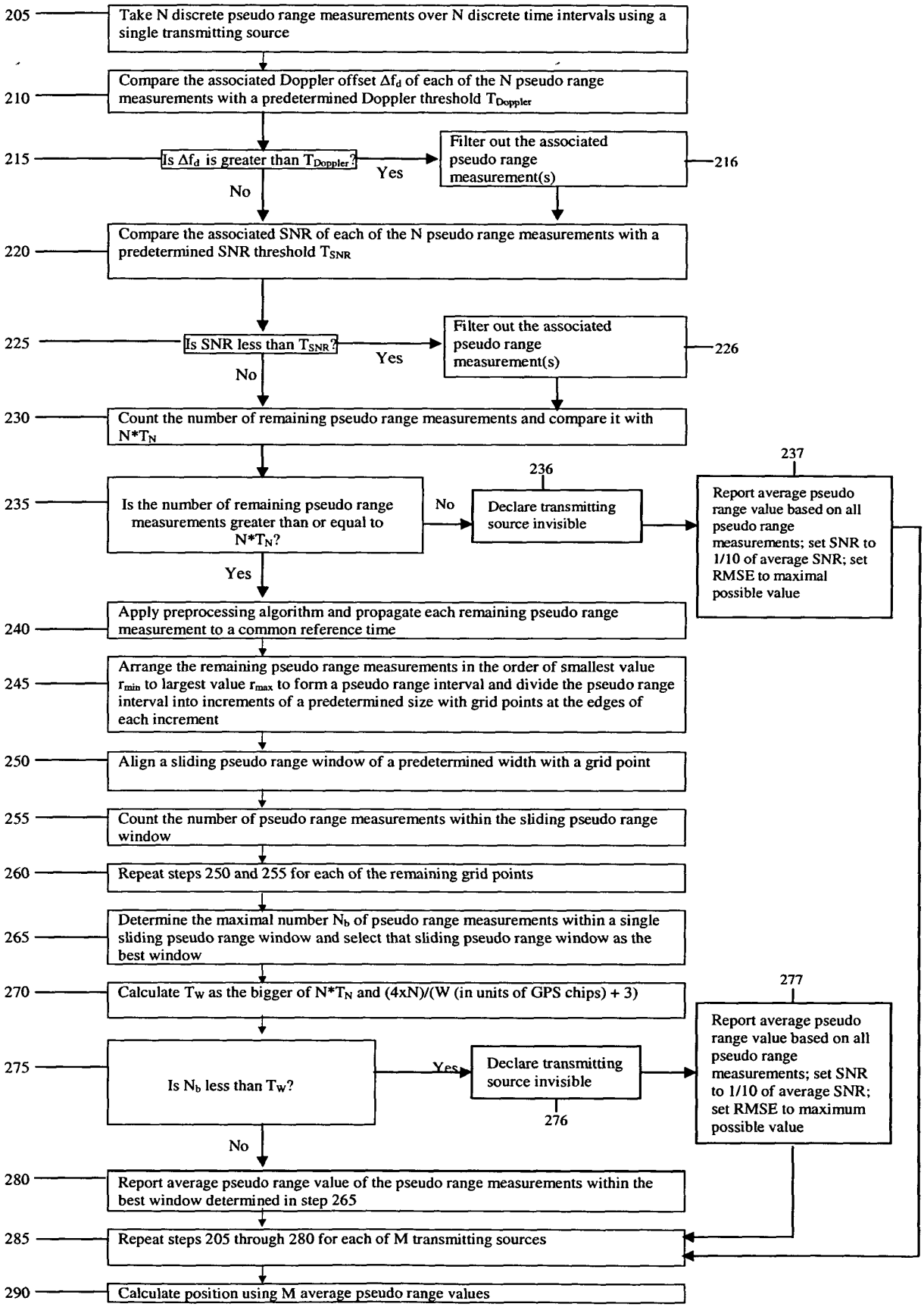
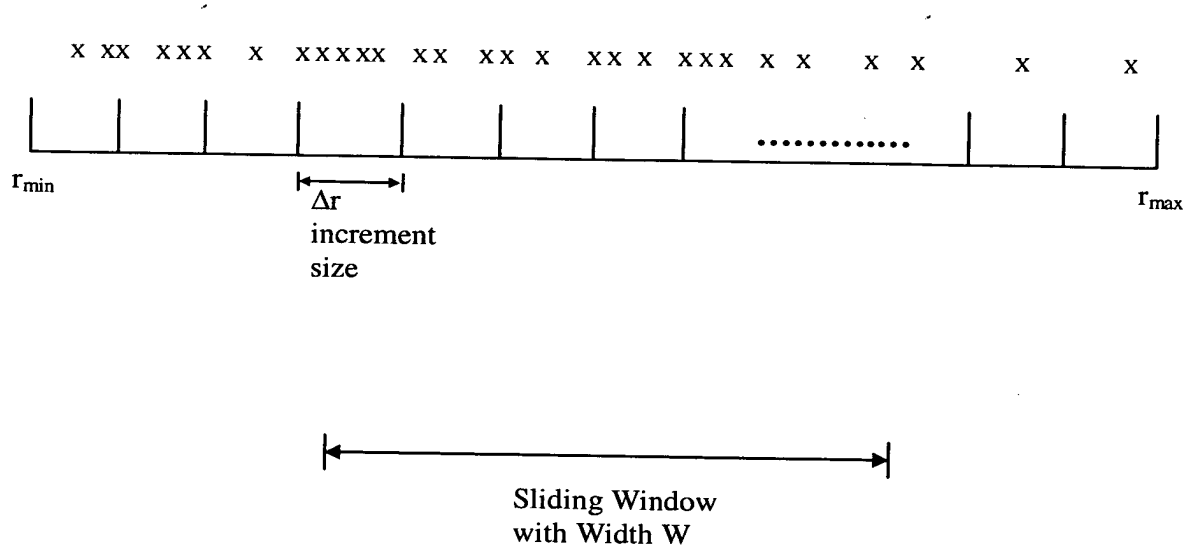

GPS Satellite 1
120a
GPS Satellite 2
120b
GPS Satellite 3
120c
GPS Satellite M
120M
110

Fig 1

FIG. 2


205
Take N discrete pseudo range measurements over N discrete time intervals using a single transmitting source
210
Compare the associated Doppler offset $\Delta f_d$ of each of the N pseudo range measurements with a predetermined Doppler threshold $T_{Doppler}$
215
Is $\Delta f_d$ is greater than $T_{Doppler}$?
Yes
Filter out the associated pseudo range measurement(s)
216
No
220
Compare the associated SNR of each of the N pseudo range measurements with a predetermined SNR threshold $T_{SNR}$
225
Is SNR less than $T_{SNR}$?
Yes
Filter out the associated pseudo range measurement(s)
226
No
230
Count the number of remaining pseudo range measurements and compare it with $N*T_N$
235
Is the number of remaining pseudo range measurements greater than or equal to $N*T_N$?
No
236
Declare transmitting source invisible
237
Report average pseudo range value based on all pseudo range measurements; set SNR to 1/10 of average SNR; set RMSE to maximal possible value
Yes
240
Apply preprocessing algorithm and propagate each remaining pseudo range measurement to a common reference time
245
Arrange the remaining pseudo range measurements in the order of smallest value $r_{min}$ to largest value $r_{max}$ to form a pseudo range interval and divide the pseudo range interval into increments of a predetermined size with grid points at the edges of each increment
250
Align a sliding pseudo range window of a predetermined width with a grid point
255
Count the number of pseudo range measurements within the sliding pseudo range window
260
Repeat steps 250 and 255 for each of the remaining grid points
265
Determine the maximal number $N_b$ of pseudo range measurements within a single sliding pseudo range window and select that sliding pseudo range window as the best window
270
Calculate $T_W$ as the bigger of $N*T_N$ and (4xN)/(W (in units of GPS chips) + 3)
277
Report average pseudo range value based on all pseudo range measurements; set SNR to 1/10 of average SNR; set RMSE to maximum possible value
275
Is $N_b$ less than $T_W$?
Yes
Declare transmitting source invisible
276
No
280
Report average pseudo range value of the pseudo range measurements within the best window determined in step 265
285
Repeat steps 205 through 280 for each of M transmitting sources
290
Calculate position using M average pseudo range values




X represents pseudo range measurements

**Fig. 3**

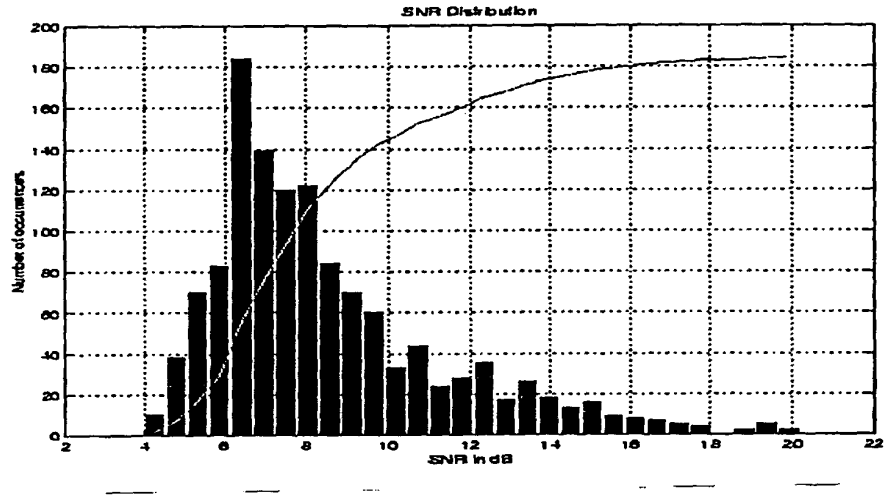
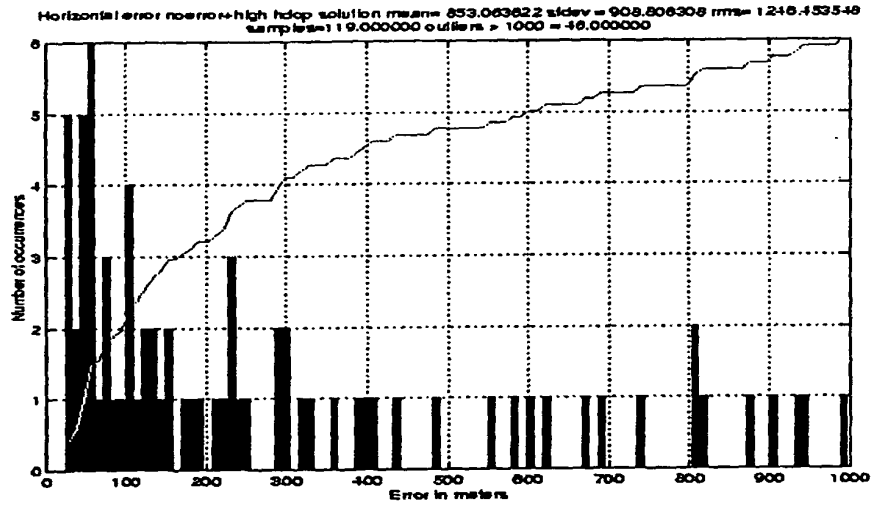
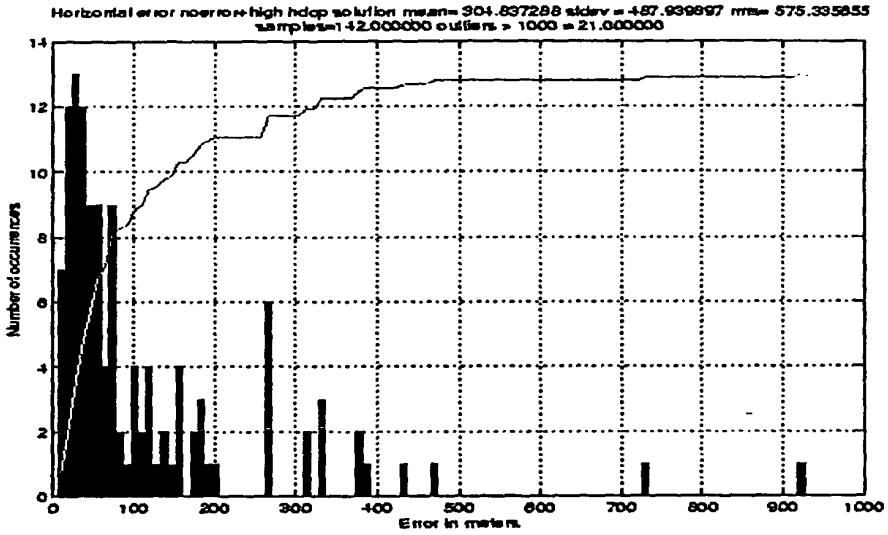



FIG. 4



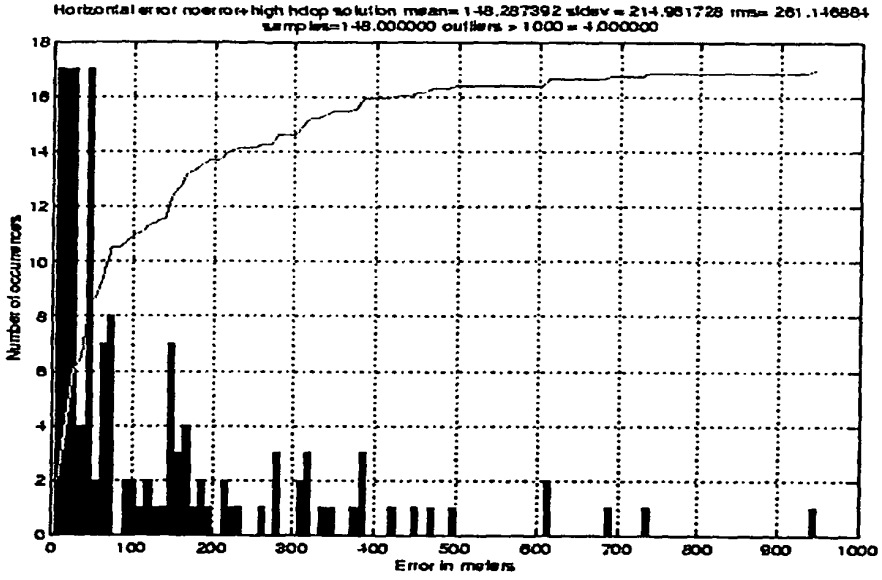

Single point measurement results

FIG. 5



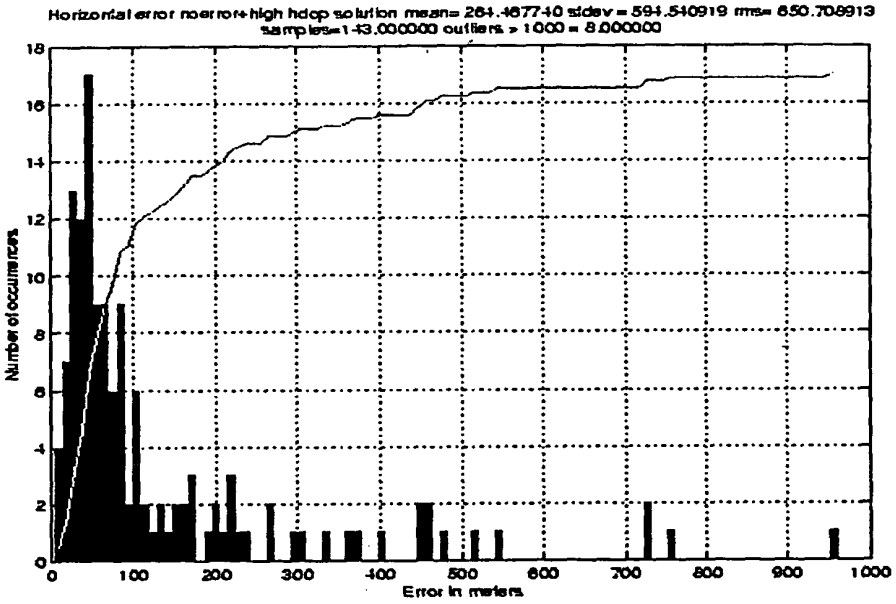

Five point position averaging

FIG. 6



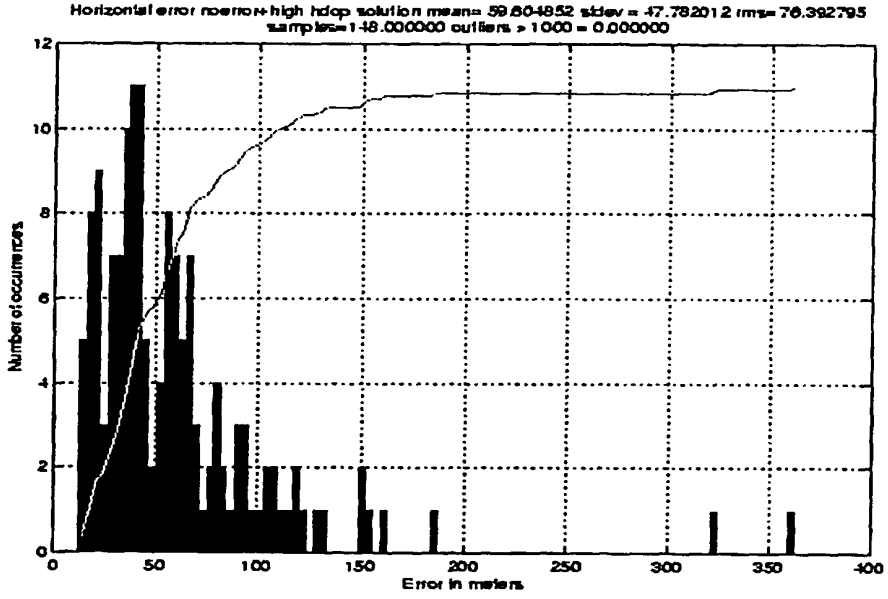

Ten point position averaging

FIG. 7




Five point pseudo range averaging

FIG. 8




Ten point pseudo range averaging

FIG. 9